

Serial No. 09/530,653  
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Claims 1-31 (cancelled).

32. (new) An article of manufacture comprising:

a metallic substrate;

a thermal barrier coating disposed on the metallic substrate;

wherein the thermal barrier coating comprises a spinel material and an oxide material admixed to the spinel material, the oxide material selected from the group of MgO, ZrO<sub>2</sub>, HfO<sub>2</sub>, NiO, CoO, Al<sub>2</sub>O<sub>3</sub> and Cr<sub>2</sub>O<sub>3</sub>.

33. (new) The article of manufacture of claim 32, wherein the spinel material is

selected from the group of CoMg<sub>2</sub>O<sub>4</sub>, CoFe<sub>2</sub>O<sub>4</sub>, CoCr<sub>2</sub>O<sub>4</sub>, CoTi<sub>2</sub>O<sub>4</sub>, CoAl<sub>2</sub>O<sub>4</sub>, NiMg<sub>2</sub>O<sub>4</sub>,

NiFe<sub>2</sub>O<sub>4</sub>, NiTi<sub>2</sub>O<sub>4</sub>, TiMg<sub>2</sub>O<sub>4</sub>, TiFe<sub>2</sub>O<sub>4</sub>, TiCr<sub>2</sub>O<sub>4</sub>, TiTi<sub>2</sub>O<sub>4</sub>, and TiAl<sub>2</sub>O<sub>4</sub>.

34. (new) The article of manufacture of claim 32, wherein a first portion of the

thermal barrier coating comprises a normal spinel material and a second portion of the thermal barrier coating comprises an inverse spinel material.

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35. (new) An article of manufacture comprising:

a metallic substrate;

a thermal barrier coating disposed on the metallic substrate;

wherein the thermal barrier coating comprises a spinel material selected from the group of  $\text{CoMg}_2\text{O}_4$ ,  $\text{CoFe}_2\text{O}_4$ ,  $\text{CoCr}_2\text{O}_4$ ,  $\text{CoTi}_2\text{O}_4$ ,  $\text{CoAl}_2\text{O}_4$ ,  $\text{NiMg}_2\text{O}_4$ ,  $\text{NiFe}_2\text{O}_4$ ,  $\text{NiTi}_2\text{O}_4$ ,  $\text{TiMg}_2\text{O}_4$ ,  $\text{TiFe}_2\text{O}_4$ ,  $\text{TiCr}_2\text{O}_4$ ,  $\text{TiTi}_2\text{O}_4$ , and  $\text{TiAl}_2\text{O}_4$ .

36. (new) The article of manufacture of claim 35, further comprising an oxide material admixed to the spinel material, the oxide material selected from the group of  $\text{MgO}$ ,  $\text{ZrO}_2$ ,  $\text{HfO}_2$ ,  $\text{NiO}$ ,  $\text{CoO}$ ,  $\text{Al}_2\text{O}_3$  and  $\text{Cr}_2\text{O}_3$ .

37. (new) An article of manufacture comprising:

a metallic substrate;

a thermal barrier coating disposed on the metallic substrate;

wherein a first portion of the thermal barrier coating comprises a normal spinel material and a second portion of the thermal barrier coating comprises an inverse spinel material.